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Abstract

PURPOSE:To grow a high-quality compound semiconductor whose piercing dislocation has been reduced by a method wherein a temperature of an Si substrate is set to a temperature at which a group V element for buffer layers can be diffused into an atomic layer composed of a group III element for buffer layers the atomic layer is formed by supplying the group III element and, after that, a buffer layer is formed by supplying the group V element.
CONSTITUTION:An Si substrate is cleaned in a vacuum at 900 deg.C; it is kept at 300 deg.C; an As raw material is supplied to the surface of the Si substrate; an As stabilized face constituted of one atomic layer of As is formed. Then, a Ga raw material for five molecular layers is supplied as GaAs; a Ga layer is formed on the As stabilized face of Si. Then, when the As raw material is supplied, an As atom is diffused to the Ga layer; a buffer layer for five molecule layers of GaAs is formed. While a temperature of the substrate is kept at 300 deg.C, the Ga raw material and the As raw material are supplied simultaneously; GaAs with a film thickness of 13nm is formed; then, the temperature of the substrate is raised to 500 deg.C; a GaAs layer with a film thickness of 2mum is grown.